BAE SYSTEMS

Equipment Reset
Where We Are…
Where We're Going…

JB BURNS
VP, Land & Armament
BAE Systems

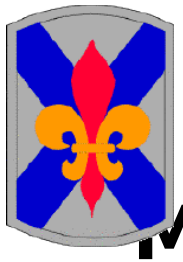
Focus on the Customer

Win the War on Terror

Execute Reset

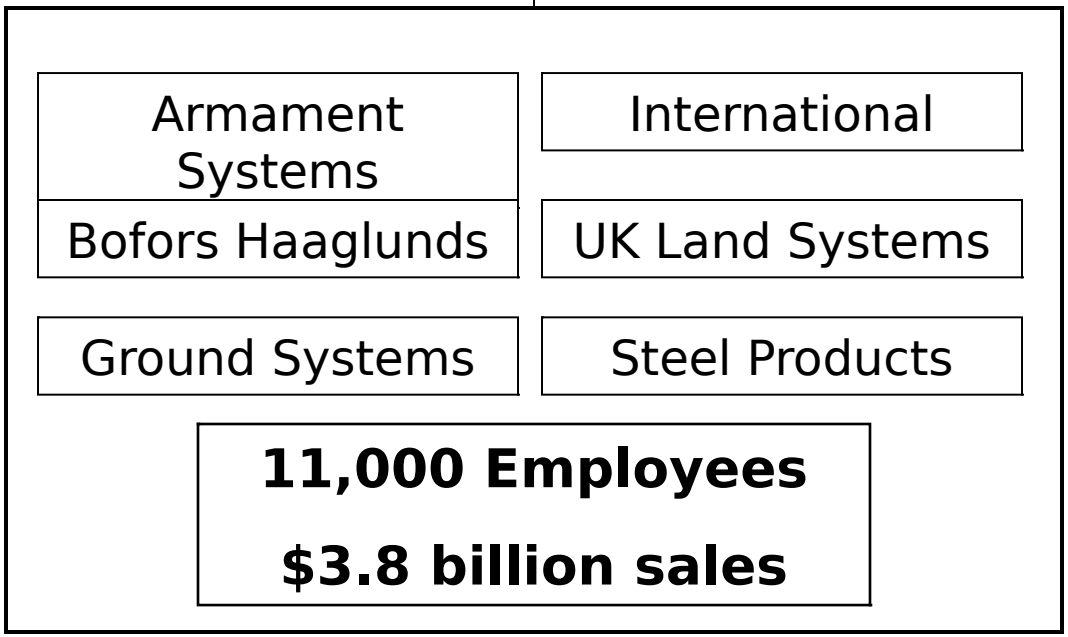
Execute Modularity

Modernize and Future Forces



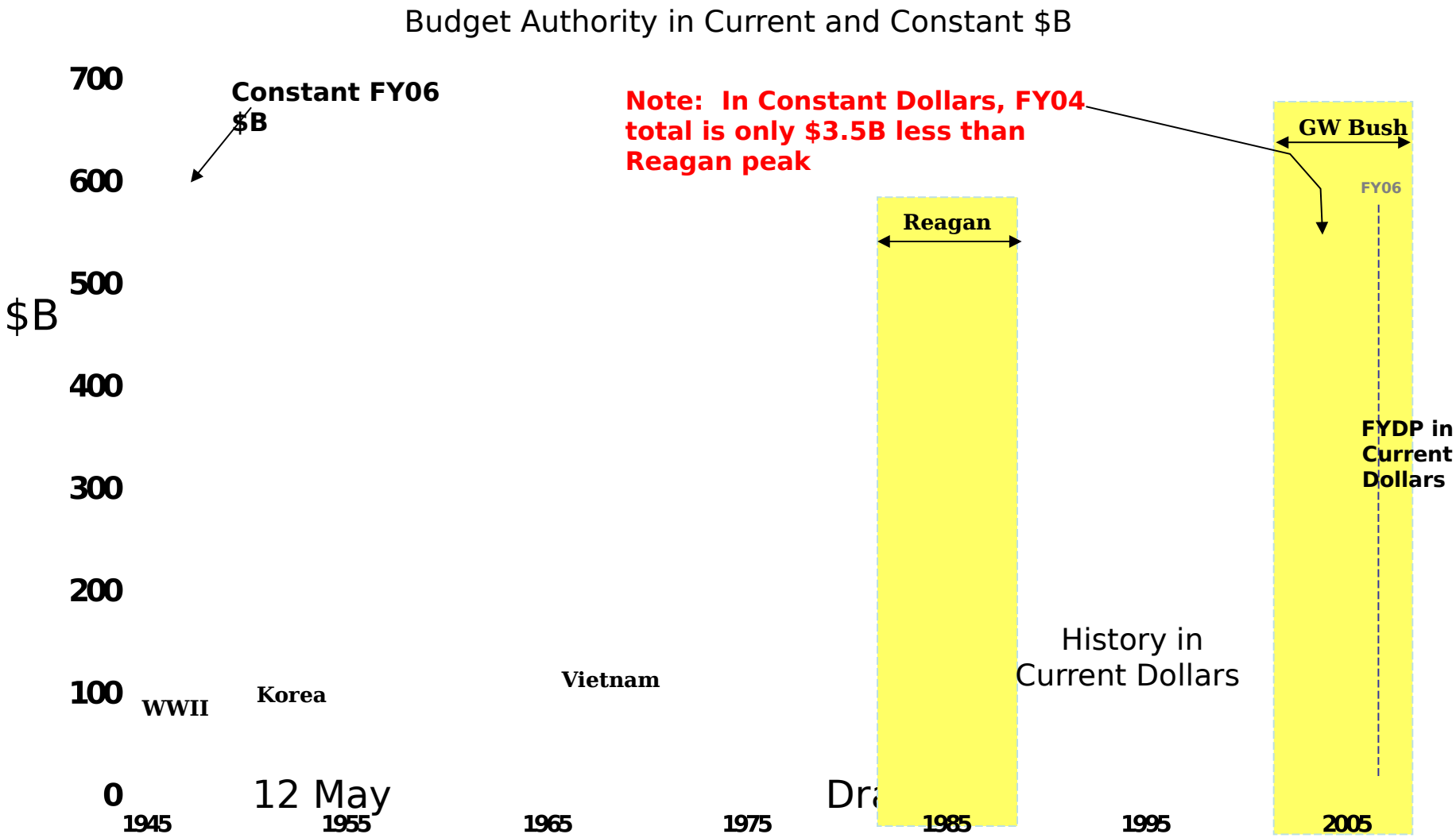
A Transatlantic Operating Group

BAE Land & Armaments



Delivering Real World-wide Advantage

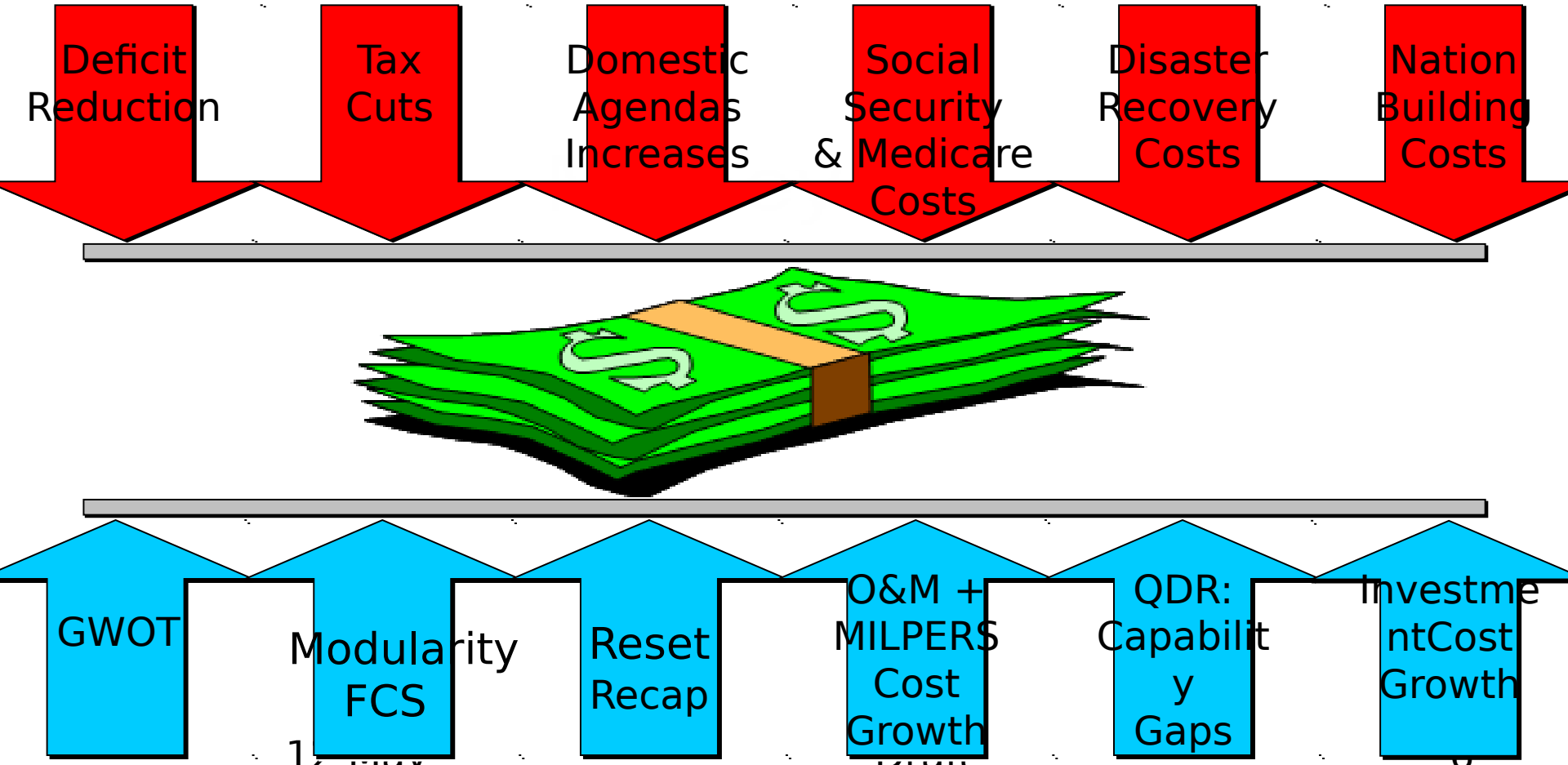
Historical Perspective: The DoD Budget



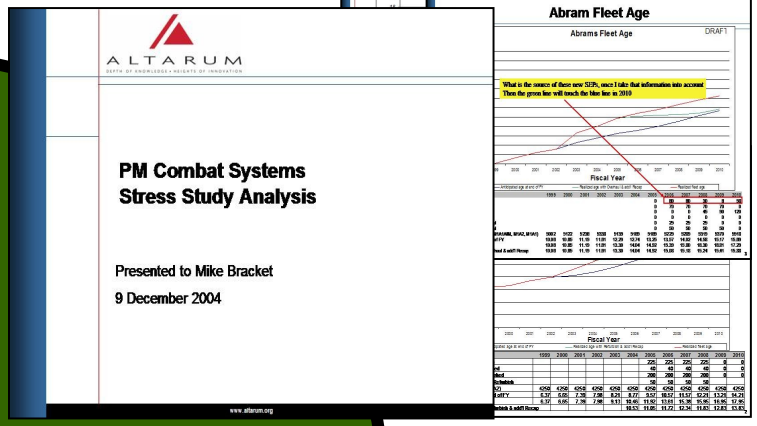
12 May

Dra

Pressures On Defense Budget



Influencing Factors

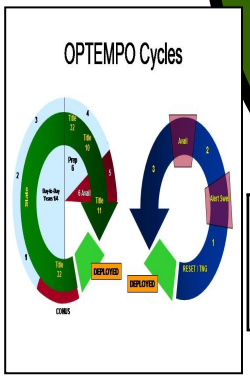


AGING FLEET

- Average Goal 8-10 Years
- Actual 15-17 Years

STRESS STUDY

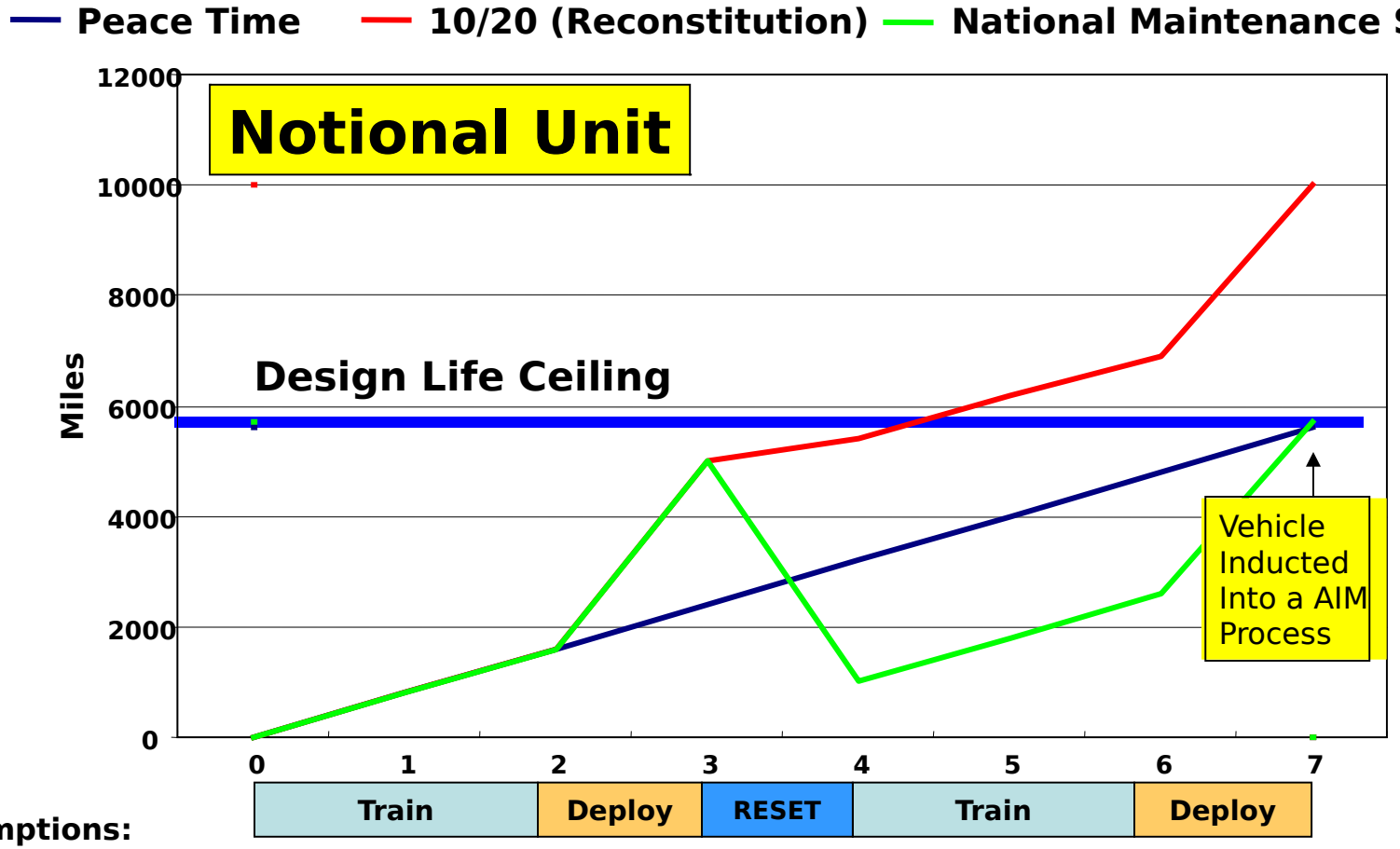
- Battle Damage
- Delayed Desert Damage
- Sporadic Services



OPTEMPO

- Planned OPTEMPO 750 MPY
- Actual OPTEMPO 7500 MPY

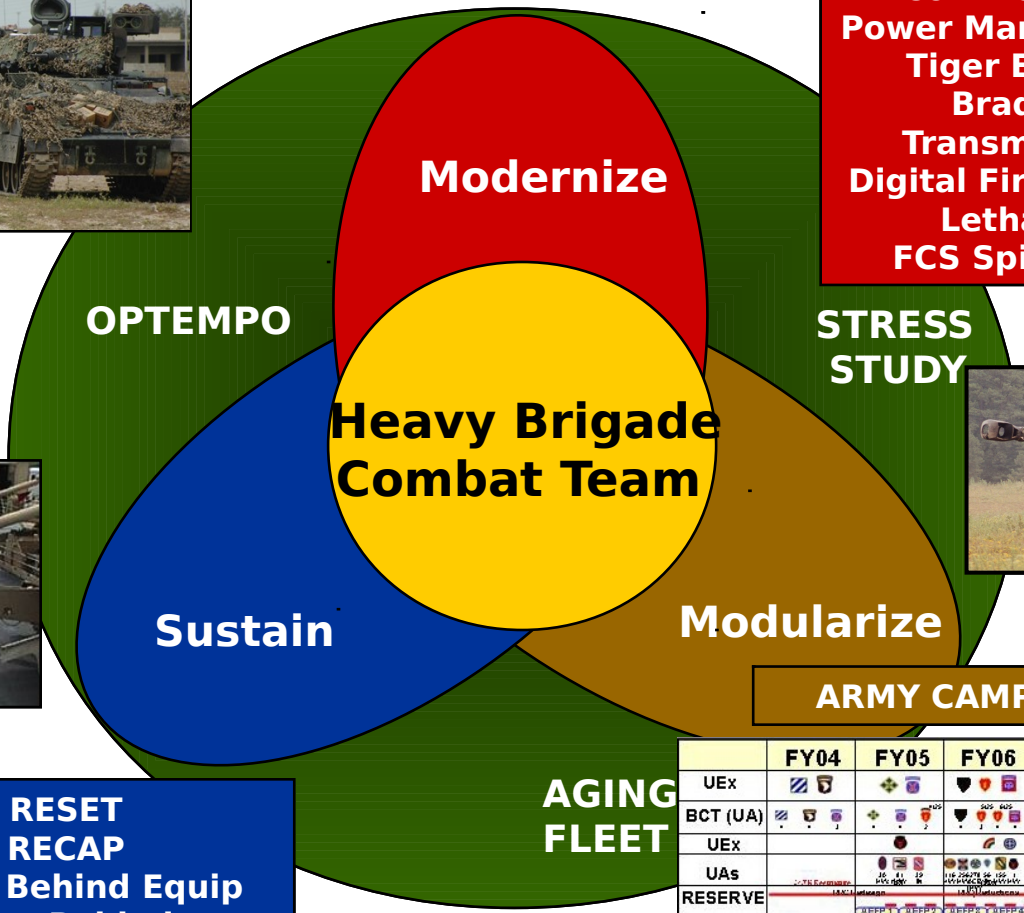
National Level RESET vs OPTEMPO



Assumptions:

- **Peace Time OPTEMPO is 800 Miles/Year**
- **Abrams Mileage in SWA is 5000-8000 Miles**
- **Objective National Level RESET model buys back > 50% life**

HBCT Fleet Strategy



Commonality
Power Management
Tiger Engine
Bradley
Transmission
Digital Fire Control
Lethality
FCS Spin Outs

RESET
RECAP
Leave Behind Equip
Stay Behind
Maintenance

ARMY CAMPAIGN PLAN

	FY04	FY05	FY06	FY07	FY08	FY09	FY10
UEx							
BCT (UA)							
UEx							
UAs							
RESERVE							
STRYKER	SBCT2	SBCT3	SBCT4	SBCT5	SBCT6		
Aviation							
FCS					Spin Out		Spin Out

12 May

BAE SYSTEMS

Equipment Reset
Where We Are…
Where We're Going…

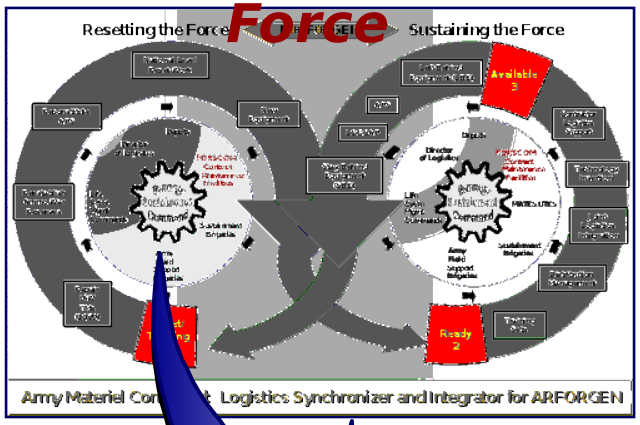
JB BURNS
VP, Land & Armament
BAE Systems

Life Cycle Management

LOGFORGEN -- SUPPORT TO ARFORGEN

COMPLEX SERVICES

Resetting the Force



AMC MANAGEMENT

- *Repair Requirements*
  - **National**
  - **Local**
  - **Unit**
- *Resource Allocation*
- *Workload Allocation / Balancing*
- *Enforcer of:*
  - **Common and Consistent Standards of Repair**

Depots / Nat Maint Contractors Repair

- *RECAP*
- *Automatic Return Items*
- *Major Overhaul*

DOL Repair

- *Below Depot Repair*
- *Repair and Return*

FLRC Repair

- *Augments DOL's*
- *Flexible Size and Mission*

MATES / UTES Repair

- *Primarily Org / DS Level*
- *Reimbursable*

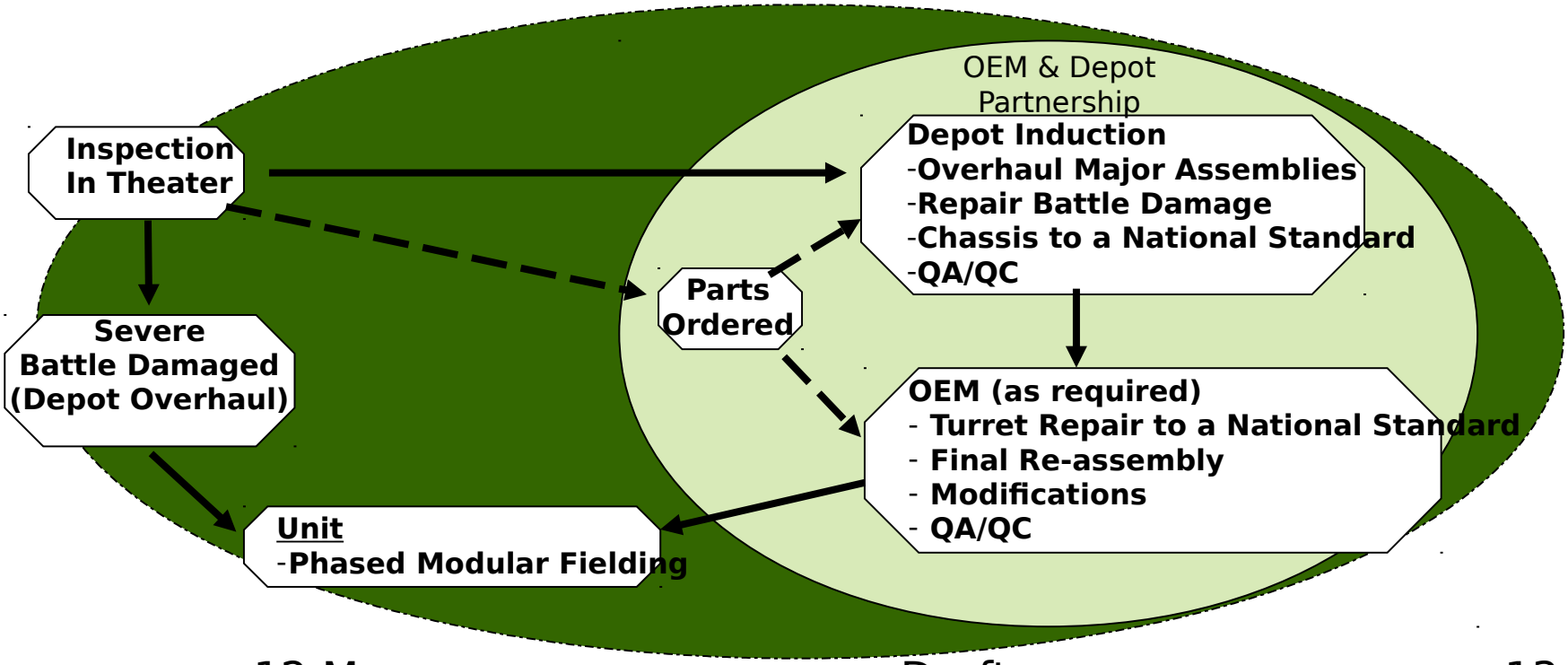
Unit Repair

- *Common Standards*
- *Generally Funded through OPTEMPO*

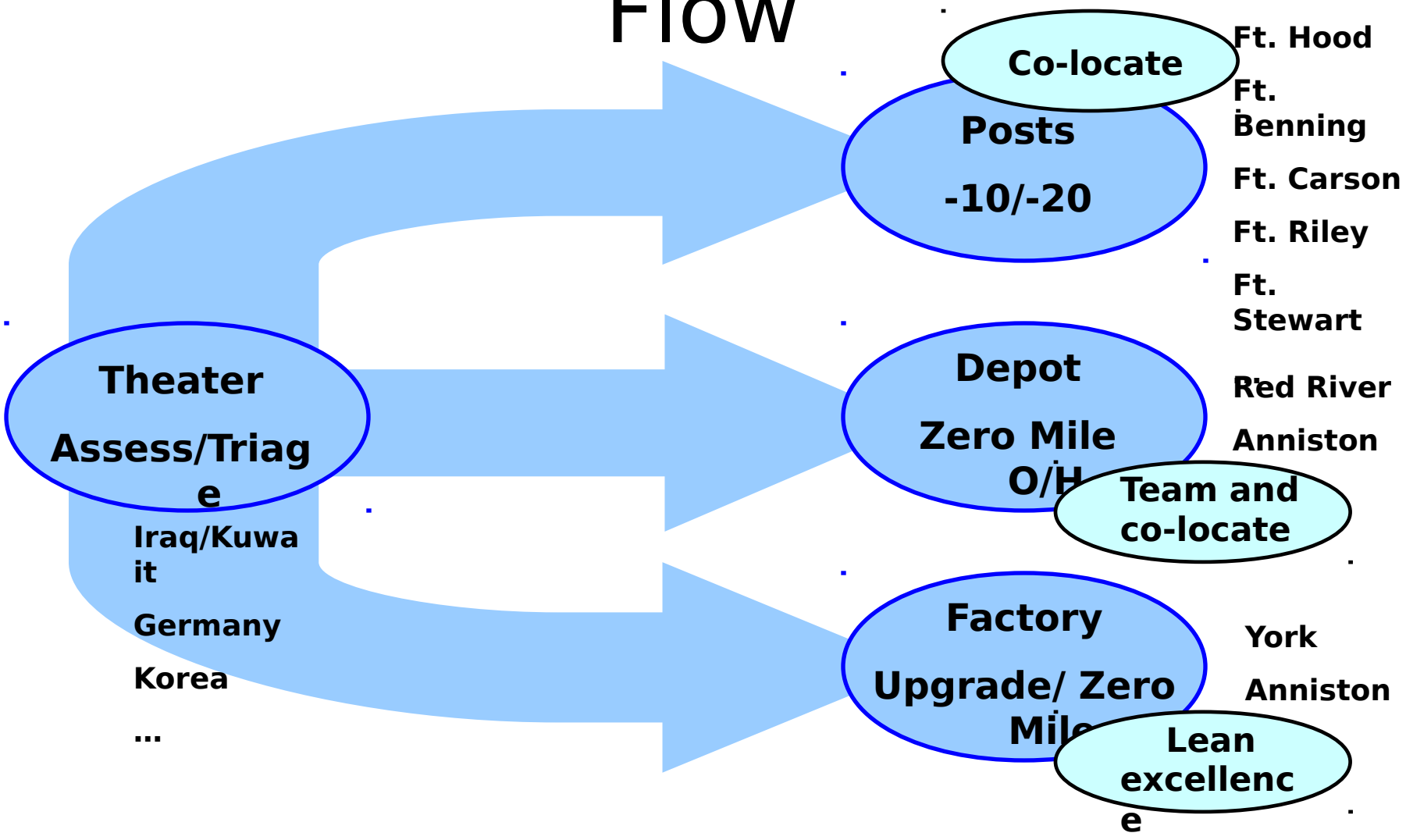
Rebuilt Brigade

Objective National Level Reset Model

Single Process… Single Standard
Integrates Redeployment-Reset-Modularity-Life Cycle Activit
Manage Timelines IAW Army Priorities and Requirements



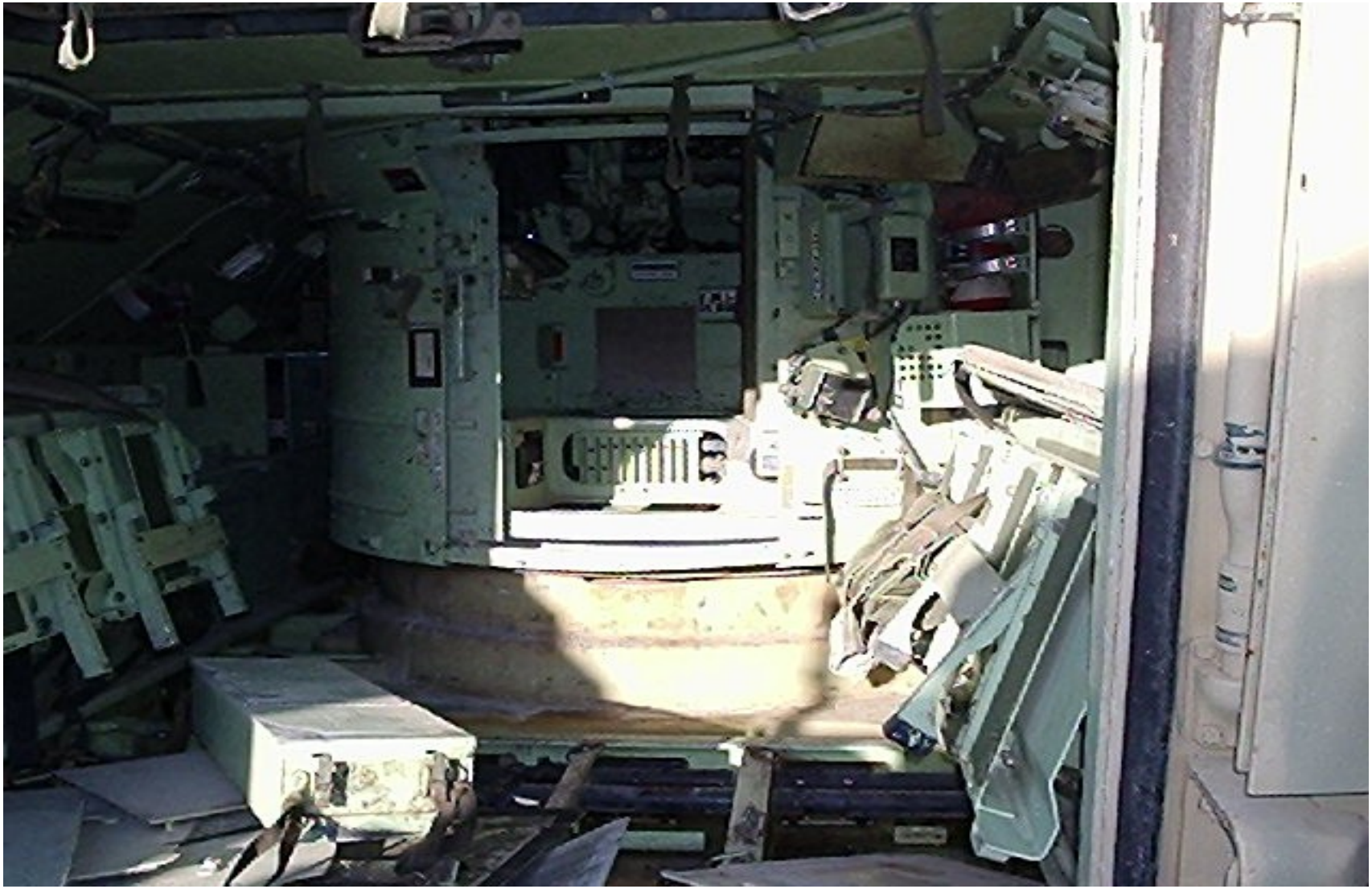
Bradley Reset and Maintenance Flow



Damage to A3 Vehicle 2AGR0108Y

Shows hull floor plate ripped open and "F" section severely deformed

View of the bottom taken from the left side and looking toward the right front corner of the vehicle. The "F" section is at the top left corner of the photo.



32A

The Bottom line

- A Nation at war, and this Industry is at war, in partnership with Soldiers and Marines.
- Quicker asset turn back to the user for rapid redeployment
- Lower cost and faster turn around than Remanufacturing
- Repair required to deal with extensive wear & tear and damage
  - √ Turret Bearings
  - √ Engines
  - √ Final Drives
  - √ Transmissions
  - √ Suspension
  - √ Vehicular Inter Comm System
- Application of Blue Force Tracking, Hull Structure and Fleet Standard Mods
- Allows replacement of failed Line Replaceable Units and Sub-systems as well as those that were removed in theater.

Significant and positive impact to Operational and War Fighter Readiness

This is The Customer
Operation Iraqi Freedom
DOD Photo
Presented Courtesy of United Defense L.P.

Back ups

Synchronized Through 2050

CURRENT → **FUTURE**

2005 **2011** **2016**

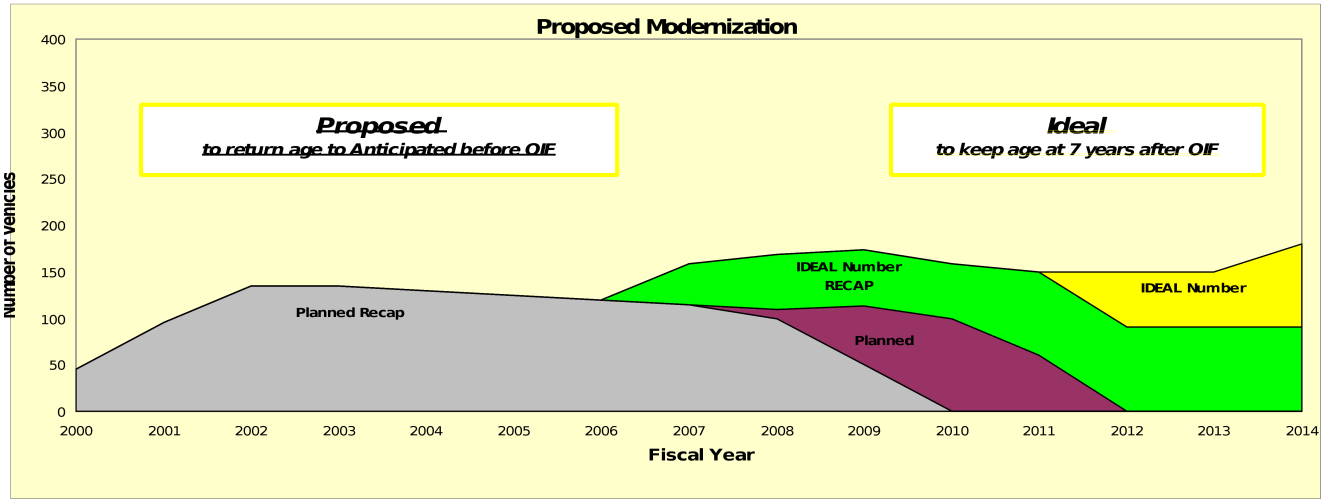
MODULARITY

MODERNIZATION

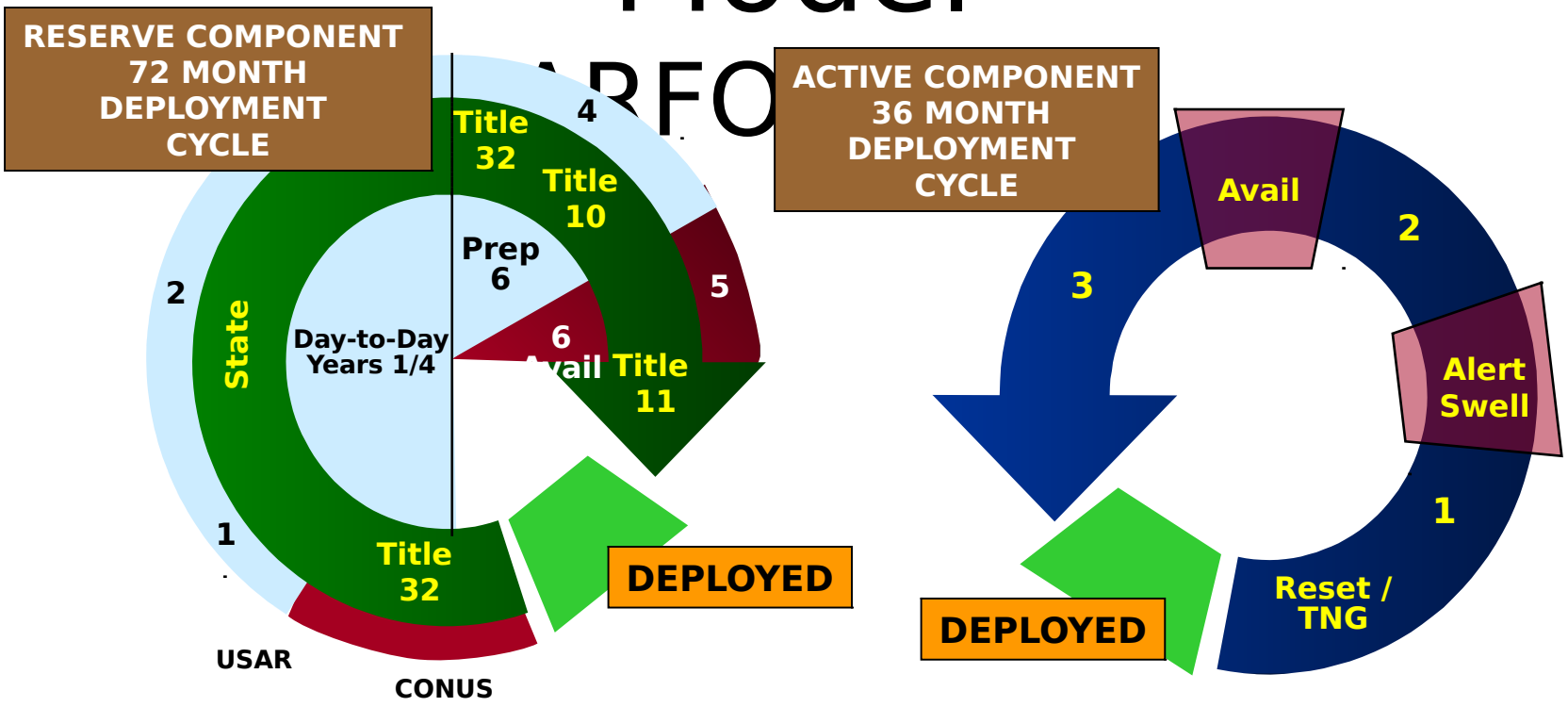
SUSTAINMENT

RESET

RECAP



Army Forces Generation Model



Synchronizes the Right Force Mix with the Right Equipment Mix at the Right Time

PM Objective is to "ONLY TOUCH THE UNIT ONCE"

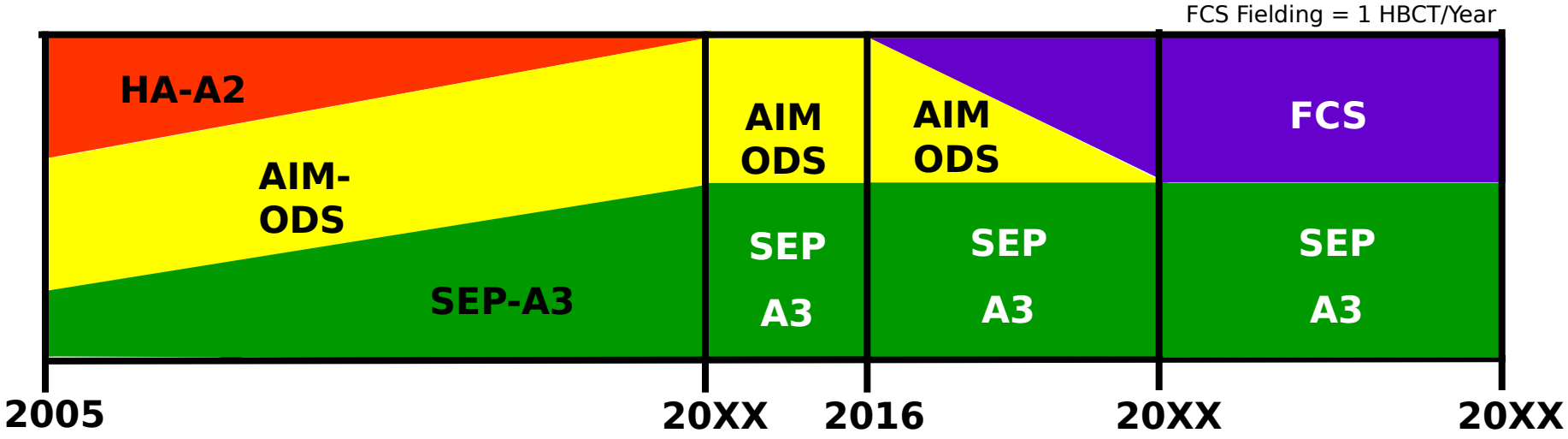
Projected Distribution of HBCT Combat Power

Current Program of Record

13-15-7
BASED ON CURRENT FUNDING
EXECUTABLE

Moving Towards…

18-17
BASED ON ARFORGEN MODEL
SUPPORTS PURE FLEET GOAL



Goal: Two Variant Mixes
M1A2 SEP & M2A3
M1A1 AIM & M2A2 ODS

Bradley Evolution to Date

- Five major baseline changes in 20 years
- Major baseline changes are made to:
  - Add a capability that did not exist
  - Replace an obsolete subsystem

A0 198**0**

TOW I
Original Final Drives
500 HP Power Engine
14.5MM Protection
1st Generation Sight
Analog Architecture
25MM Cannon
Hydro-mech
Transmission

A1 198**6**

Integrated Gas Masks
Automatic Fire Suppression

TOW II
Enhanced Final Drives
500 HP Power Engine
14.5MM Protection
1st Generation Sight
Analog Architecture
25MM Cannon
Hydro-mech
Transmission

A2 198**8**

Spall Liners
Reactive Armor Tiles
Integrated Gas Masks
Automatic Fire Suppression

TOW II
Enhanced Final Drives
600 HP Engine
30MM Protection
1st Generation Sight
Analog Architecture
25MM Cannon
Hydro-mech
Transmission

A2-ODS 199**3**

Laser Rangefinder
GPS Navigation
Driver Thermal Viewer
Spall Liners
Reactive Armor Tiles
Integrated Gas Masks
Automatic Fire Suppression

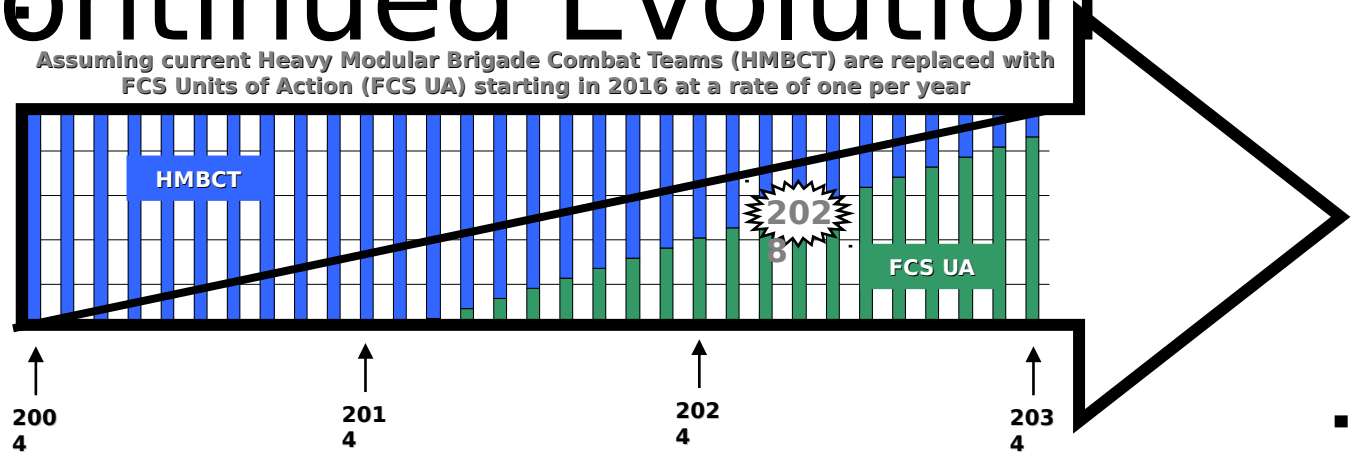
TOW II
Enhanced Final Drives
600 HP Engine
30MM Protection
1st Generation Sight
Analog Architecture
25MM Cannon
Hydro-mech
Transmission

A3 200**0**

Computer processor
CDR Independent Sight
Full Solution Fire Control
Digital Command and Control
Titanium Roof Armor
Embedded Diagnostics
Laser Rangefinder
Inertial Navigation
Driver Thermal Viewer
Spall Liners
Reactive Armor Tiles
Integrated Gas Masks
Automatic Fire Suppression

TOW II
Enhanced Final Drives
600 HP Engine
30MM Protection
2nd Generation Sight
Digital Architecture
25MM Cannon
Hydro-mech
Transmission

Continued Evolution



A3 **200 0**

Computer processor
CDR Independent Sight
Full Solution Fire Control
Digital Command and Control
Titanium Roof Armor
Embedded Diagnostics
Laser Rangefinder
Inertial Navigation
Driver Thermal Viewer
Spall Liners
Reactive Armor Tiles
Integrated Gas Masks
Automatic Fire Suppression

TOW II
Enhanced Final Drives
600 HP Engine
30MM Protection
2nd Generation Sight
Digital Architecture
25MM Cannon
Hydro-mech Transmission

- Given the history of the program (as well as most other programs) that would mean at least four major baseline changes between now and 2028
- Obsolescence or commercial unavailability drives further evolution
  - Mechanical components:
    - Two of the original A0 subsystems (25MM gun; hydro-mechanical transmission) will probably be either obsolete or unsustainable in the next five years
  - Analog electrical components
    - Many analog components are no longer available anywhere. Even excess stocks held as “lifetime buys” are being rapidly depleted as a result of the war
  - Digital components. Keep pace with programs that require increased data storage and processing speed

Modernization

TUSK
TIGER Engine (AGT 1500) 2nd Gen FLIR
FBCB2
Digital Architecture

Maintain Combat Overmatch

Improve Survivability

Improve Lethality

Improve Power Management

Upgrade Electronics

Integrate SoS Common Operating Environment (SOSCOE)

Implement Common Logistic Operating Environment (CLOE)

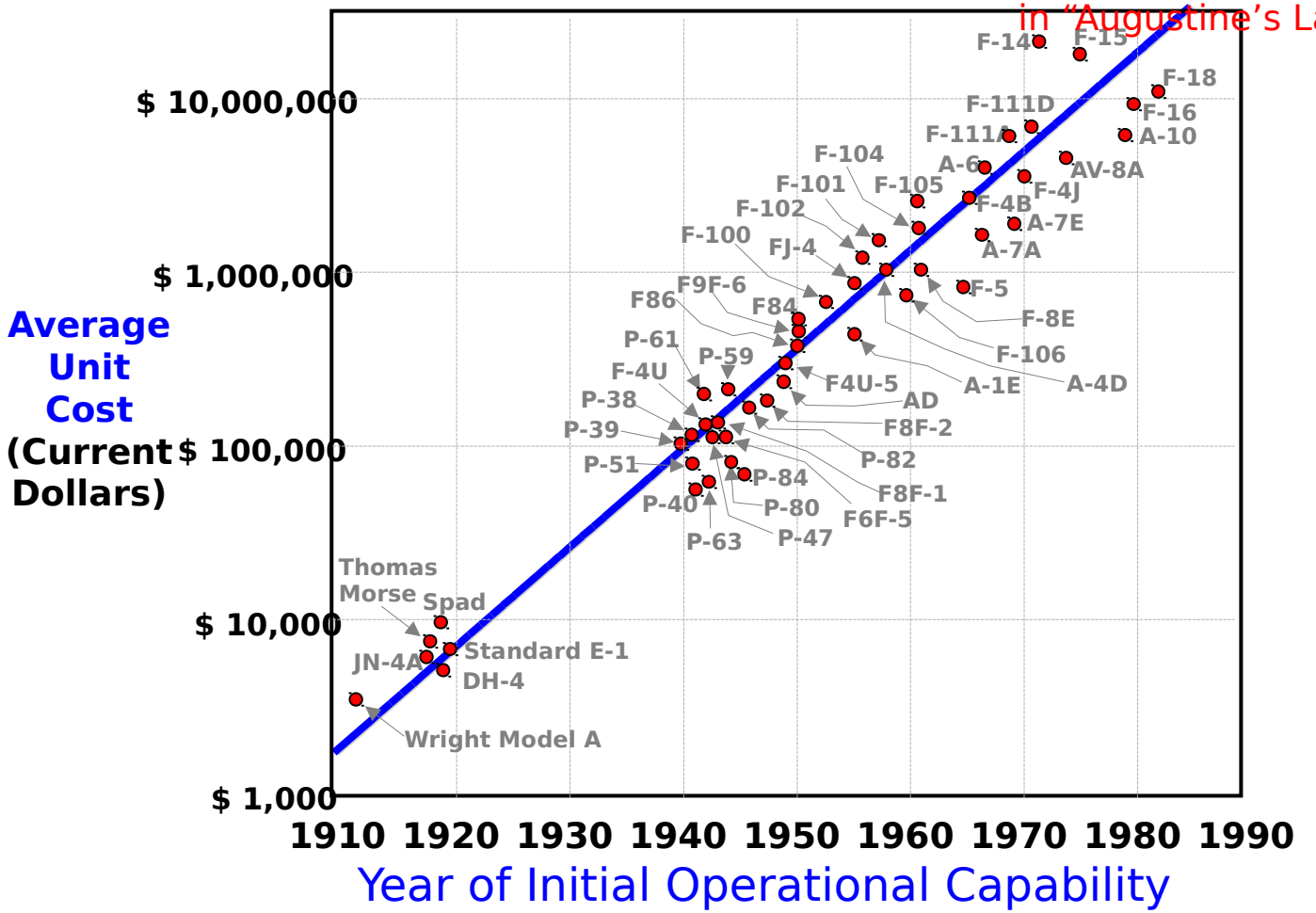
Urban Combat Kit
Improved Transmission
2nd Gen FLIR
FBCB2
Digital Architecture

Upgrade Power Train
T-150 Track
AoA Provisions
Transmission
Vehicle Intercom System

Digital Fire Control
Modular Charge System
Excalibur
Auxilary Power Unit
S3 Sensor Integration

"The unit cost of tactical aircraft has increased in a very consistent manner since the beginning of the aviation age. The rate-of-climb is a factor of four every ten years. There is no ceiling in sight."

– Norman R. Augustine
in "Augustine's Laws"



Source: Norman R. Augustine, "Augustine's Laws," 6th Edition, 1997. Used by permission.

Definitions

Reconstitution: Restore units to a desired level of combat effectiveness **commensurate with mission requirements and available resources.** Uses existing systems and units to do so**.** **No resour exist solely to perform reconstitution.**

RESET (Hybrid): **Depot Level** overhaul of CVE and Battle Damaged Vehicles to replace Unit losses and restore equipment within a specific timeframe**. Includes all units deployed in OIF/OEF.**

National Level RESET: **Program between** Depot and OEM to repair vehicles to RESET standards + 3D + Lessons Learned **from previous vehicle deployments + Modifications.**

Recapitalization: Extends service life**, stabilizes the** rate of growth **of operating and support costs, improves reliability, maintainability, safety, and the efficiency of recapitalized systems. Army's RECAP strategy follows two paths: rebuild and selected upgrade.**

UK Land Systems Products

Draft

The Systems

Abrams

M1A1
M1A1 AIM

M1A2
SEP

M104
Wolverine

Panther II

Bradley

M2/3A2
M2/3A2 Operation Desert Storm (ODS) M2A2 ODS-Engineer

M2/3 Bradley A3

Bradley Commander Vehicle (BCV) ODS
BCV A3

M4 Command and Control Vehicle (C2V)

M3A2

Paladin

M109A6
Paladin

M992A2 (FAASV)
Field Artillery Ammunition Supply Vehicle

M113

M1068A3 Standard Integrated Command Post System (SICPS) Carrier

M113A3
Variants

Fire Support

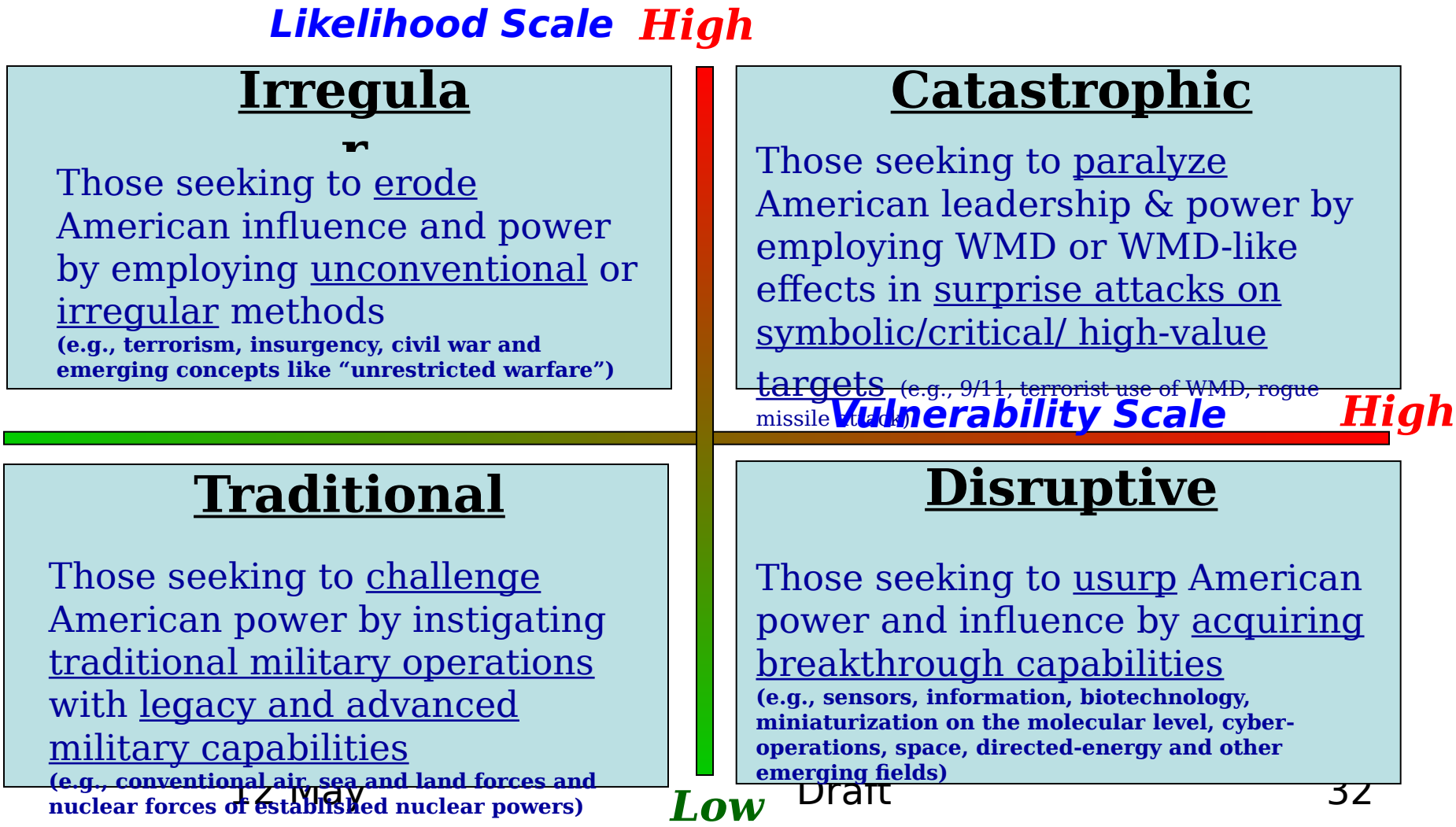
M3A3 BFIST
M7 Bradley Fire Support Team (BF

MLRS
Carrier

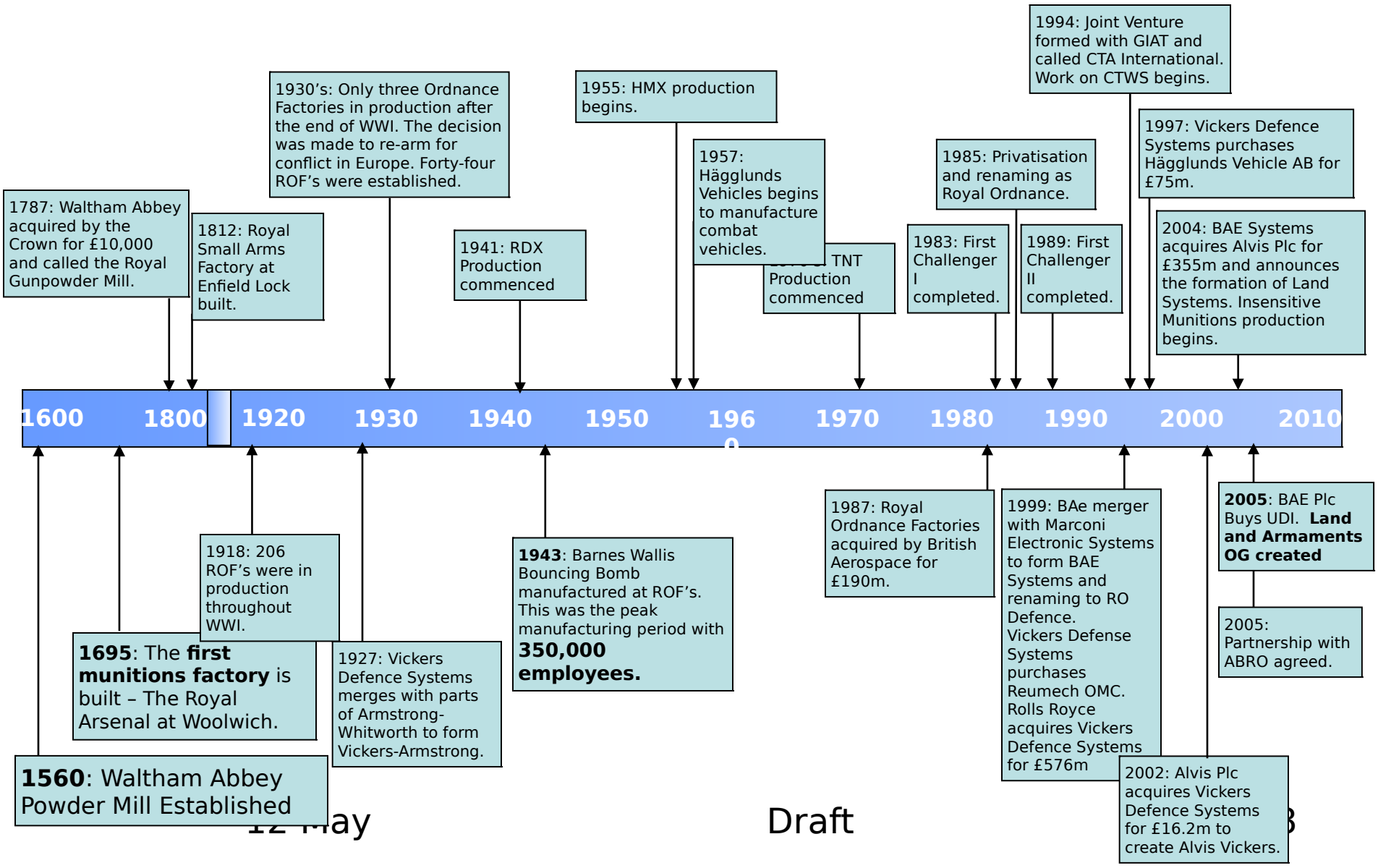
M707
Knight

25,000+ Platforms Total

DoD's QDR Challenges


Likelihood Scale
High
Irregular
Those seeking to erode American influence and power by employing unconventional or irregular methods
(e.g., terrorism, insurgency, civil war and emerging concepts like "unrestricted warfare")
Catastrophic
Those seeking to paralyze American leadership & power by employing WMD or WMD-like effects in surprise attacks on symbolic/critical/ high-value targets (e.g., 9/11, terrorist use of WMD, rogue missile attack)
Vulnerability Scale
High
Traditional
Those seeking to challenge American power by instigating traditional military operations with legacy and advanced military capabilities
(e.g., conventional air, sea and land forces and nuclear forces of established nuclear powers)
Disruptive
Those seeking to usurp American power and influence by acquiring breakthrough capabilities
(e.g., sensors, information, biotechnology, miniaturization on the molecular level, cyber-operations, space, directed-energy and other emerging fields)
Low

BAE…. A prestigious history


1787: Waltham Abbey acquired by the Crown for £10,000 and called the Royal Gunpowder Mill.
1812: Royal Small Arms Factory at Enfield Lock built.
1930's: Only three Ordnance Factories in production after the end of WWI. The decision was made to re-arm for conflict in Europe. Forty-four ROF's were established.
1941: RDX Production commenced
1955: HMX production begins.
1957: Hägglunds Vehicles begins to manufacture combat vehicles.
TNT Production commenced
1983: First Challenger I completed.
1985: Privatisation and renaming as Royal Ordnance.
1989: First Challenger II completed.
1994: Joint Venture formed with GIAT and called CTA International. Work on CTWS begins.
1997: Vickers Defence Systems purchases Hägglunds Vehicle AB for £75m.
2004: BAE Systems acquires Alvis Plc for £355m and announces the formation of Land Systems. Insensitive Munitions production begins.
1600
1800
1920
1930
1940
1950
196 0
1970
1980
1990
2000
2010
1560: Waltham Abbey Powder Mill Established
1695: The first munitions factory is built – The Royal Arsenal at Woolwich.
1918: 206 ROF's were in production throughout WWI.
1927: Vickers Defence Systems merges with parts of Armstrong-Whitworth to form Vickers-Armstrong.
1943: Barnes Wallis Bouncing Bomb manufactured at ROF's. This was the peak manufacturing period with 350,000 employees.
1987: Royal Ordnance Factories acquired by British Aerospace for £190m.
1999: BAe merger with Marconi Electronic Systems to form BAE Systems and renaming to RO Defence.
Vickers Defense Systems purchases Reumech OMC.
Rolls Royce acquires Vickers Defence Systems for £576m
2002: Alvis Plc acquires Vickers Defence Systems for £16.2m to create Alvis Vickers.
2005: BAE Plc Buys UDI. Land and Armaments OG created
2005: Partnership with ABRO agreed.

Sustainment Goals

1. **Improve Operational Readiness**

2. **Reduce O and S Costs**

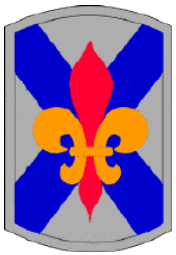
X. **Manage Obsolescence**

X. **Provide Base for Modernization**

X. **Tech Insertion (Align with FCS)**

X. **Maintain Fleet Age**

Sustainment Goals



- Sustain the fight..

Goals Apply to AC and RC

- Reduce Fleet Age
- Perform Modifications
- Reduce Obsolescence
- Provide Base for Modernization
  - Tech Insertion
  - Baseline all vehicles
- Improve Readiness
- Reduce Operating Costs

PARTNERING AT AMC DEPOTS

CULTURE OF INNOVATION

Common Partnership Objectives

- **100% parts availability**
- **Reduced cycle time**
- **Improve performance**
- **Provide long-term sustainment**
- **Improve readiness and reliability of product**
- **Decreased cost**

Honeywell	BAE Systems	Northrop Grumman	EPS
AGT 1500 Engine	Ground Systems Division Bradley	Command Post Platform	AN/PRC112D

ANNISTON ARMY DEPOT
WEAPONS ◆ COMBAT VEHICLES ◆ AMMUNITION

RED RIVER ARMY DEPOT
OUR BEST - NOTHING LESS

TOBYHANNA ARMY DEPOT
EXCELLENCE IN ELECTRONICS

TOBYHANNA ARMY DEPOT
EXCELLENCE IN ELECTRONICS

Honeywell

BAE SYSTEMS

NORTHROP GRUMMAN
Information Technology

EPS